What is claimed is:

1. An apparatus for converting a gas stream containing hydrocarbons to a reaction product containing effluent molecules having at least one carbon atom, comprising:

a housing, having at least one interior surface and at least one exterior surface;

a first electrode and a second electrode, wherein the first electrode and the second electrode are selectively movable in relation to each other and positioned within the housing so as to be spatially disposed a predetermined distance from each other;

means for producing a plasma discharge between the first electrode and the second electrode;

means for passing the gas stream containing hydrocarbons between the first electrode and the second electrode; and

means for collecting the reaction product effluent produced by the reaction of the gas stream containing hydrocarbons with the plasma discharge between the first and second electrodes.

2. The apparatus of claim 1, wherein at least one of the first and second electrodes is positioned substantially outside the housing and at least one of the first and second electrodes is positioned substantially within the housing.

3. The apparatus of claim 1, further comprising at least one spacing member disposed adjacent to at least one of the first and second electrodes for spatially maintaining the first and second electrodes at the predetermined distance.

4. The apparatus of claim 3, wherein the spacing member is a dielectric material.

5. The apparatus of claim 4, wherein the dielectric material is glass.

6. The apparatus of claim 4, wherein the spacing member is an exterior surface of the housing.

7. The apparatus of claim 4, wherein the dielectric material is operably associated with at least a portion of one of the first and second electrodes.

8. The apparatus of claim 3, wherein the spacing member is a non-conducting spacer having a passageway extending therethrough for allowing the passage and collection of the gas stream containing hydrocarbons between the first and second electrodes.

9. The apparatus of claim 3, wherein the spacing member comprises a dielectric material and a non-conducting spacer.

10. The apparatus of claim 1, further comprising means for condensing the effluent.

11. The apparatus of claim 1, further comprising means for condensing the reaction product produced by the reaction of the gas stream containing hydrocarbons with the plasma discharge and wherein the reaction product condensing means is disposed within the housing.

12. The apparatus of claim 11, wherein the reaction product condensing means comprises channels extending along at least a portion of the interior surface of the housing for collecting the condensed reaction products.

13. The apparatus of claim 11, wherein the reaction product condensing means comprises a liquid substantially adjacent the exterior surface of the housing.

14. The apparatus of claim 11, wherein the reaction product condensing means comprises a membrane operably attached to at least a portion of the interior surface of the housing, such that the reaction product flows through at least a portion of the membrane.

15. The apparatus of claim 11, wherein the reaction product condensing means is provided with channels extending along at least a portion of the interior surface of the housing for collecting the

condensed reaction products, a liquid flowing substantially adjacent the exterior surface of the housing, and a membrane operably attached to at least a portion of the interior surface of the housing, such that the reaction product flows through at least a portion of the membrane.

16. The apparatus of claim 1, wherein the reaction product is absorbable, further comprising means for absorbing an absorbable reaction product produced by the reaction of the gas stream containing hydrocarbons with the plasma discharge.

17. The apparatus of claim 16, wherein the absorbing means is a liquid capable of absorbing the absorbable reaction product.

18. The apparatus of claim 17, wherein the liquid is a solution of an effective amount of a silver salt.

19. The apparatus of claim 1, wherein the reaction product is adsorbable, further comprising means for adsorbing an adsorbable reaction product produced by the reaction of the gas stream containing hydrocarbons with the plasma discharge.

20. The apparatus of claim 19, wherein the adsorbing means is a solid capable of adsorbing the adsorbable reaction product.

21. The apparatus of claim 20, wherein the solid is an effective amount of an adsorbant.

22. The apparatus of claim 21, wherein the adsorbant is a zeolite.

23. The apparatus of claim 1, further comprising a layer of material operably connected to at least one of the first and second electrodes.

24. The apparatus of claim 23, wherein the layer of material is a material capable of modifying the reaction of the stream of gas containing hydrocarbons with the plasma discharge.

25. The apparatus of claim 24, wherein the layer of material capable of modifying the reaction of the stream of gas containing hydrocarbons with the plasma discharge is a single metal oxide.

26. The apparatus of claim 25, wherein the single metal oxide layer of material is selected from the group consisting of CaO, PbO, Sm_2O_3, and La_2O_3.

27. The apparatus of claim 24, wherein the layer of material capable of modifying the reaction of the stream of gas containing hydrocarbons with the plasma discharge is a multiple metal oxide.

28. The apparatus of claim 27, wherein the multiple metal oxide layer of material is selected from the group consisting of Li/MgO, Sr/La_2O_3, Sm_2O_3, NaOH/CaO, Na_2O/Pr_2O_3, Ca/Ni/K oxide, La_2O_3, Bi_2O_3-K_2CO_3-Al_2O_3.

29. The apparatus of claim 27, wherein the multiple metal oxide layer of material is a perovskite selected from the group consisting of $LaMnO_3$, $LaAlO_3$, $SrTiO_3$, $CrLa_{1-x}Sr_xO_3$, and $BaPb_{1-x}Bi_xO_3$.

30. The apparatus of claim 27, wherein the multiple metal oxide layer of material is a zeolite selected from the group consisting of mordenite, faujasite, X zeolite, Y zeolite, and ZSM5.

31. The apparatus of claim 30, wherein the zeolite is chemically or physically altered so as to provide a zeolite having a substantially changed activity.

32. A method for converting a gas stream containing hydrocarbons to a reaction product effluent containing molecules having at least one carbon atom, comprising the steps of:

providing an apparatus, wherein the apparatus comprises,

a housing having at least one interior surface and at least one exterior surface,

a first electrode and a second electrode, wherein the first and second electrodes are selectively movable in relation to each other and positioned within the

housing so as to be spatially disposed a predetermined distance from each other,

means for producing a plasma discharge between the first and second electrodes,

means for passing the gas stream containing hydrocarbons between the first and second electrodes; and

means for collecting a reaction product effluent from the housing;

producing a plasma discharge between the first and second electrodes;

introducing a gas stream containing hydrocarbons into the housing, wherein the gas stream is passed into the plasma discharge causing the hydrocarbons within the gas stream to be converted into reacted hydrocarbons having at least two carbon atoms; and

collecting the reacted hydrocarbons as an effluent from the housing.

33. The method of claim 32, wherein in the step of providing the apparatus, the apparatus further comprises at least one spacing member operably associated with at least one of the first and second electrodes for spatially maintaining the first and second electrodes at the predetermined distance.

34. The method of claim 33, wherein the spacing member is a dielectric material.

35. The method of claim 34, wherein the dielectric material is glass.

36. The method of claim 34, wherein the dielectric material is operably associated with at least a portion of one of the first and second electrodes.

37. The method of claim 33, wherein in the step of providing at least one spacing member, the spacing member is a non-conducting spacer having a passageway extending therethrough for allowing the passage and collection of the gas stream containing hydrocarbons between the first and second electrodes.

38. The method of claim 33, wherein in the step of providing at least one spacing member, the spacing member comprises a dielectric material and a non-conducting spacer.

39. The method of claim 32, further comprising the step of condensing the effluent.

40. The method of claim 39, wherein in the step of condensing the effluent, the effluent is a gas.

41. The method of claim 39, wherein in the step of condensing the effluent, the effluent is a liquid.

42. The method of claim 39, wherein in the step of condensing the effluent, the effluent is a mixture of a gas and a liquid.

43. The method of claim 32, wherein in the step of providing the apparatus, the apparatus further comprises means for condensing the effluent, wherein the means for condensing is disposed within the housing.

44. The method of claim 43, wherein the means for condensing is provided with channels extending along at least a portion of the interior surface of the housing.

45. The method of claim 43, wherein in the step of providing a means for condensing a reaction product, the reaction product condensing means is a liquid substantially adjacent the exterior surface of the housing.

46. The method of claim 43, wherein in the step of providing a means for condensing a reaction product, the reaction product condensing means comprises a membrane operably attached to at least a portion of the interior surface of the housing such that the reaction product flows through the membrane.

47. The method of claim 43, wherein in the step of providing a means for condensing a reaction product, the reaction product condensing means is provided with channels extending along at least

a portion of the interior surface of the housing for collecting the condensed reaction products, a liquid flowing substantially adjacent the exterior surface of the housing, and a membrane operably attached to at least a portion of the interior surface of the housing such that the reaction product flows through the membrane.

48. The method of claim 32, further comprising the step of absorbing an absorbable reaction product produced by the reaction of the gas stream containing hydrocarbons with the plasma discharge.

49. The method of claim 48, further comprising absorbing an absorbable reaction product, by using a liquid capable of absorbing the absorbable reaction product.

50. The method of claim 48, further comprising absorbing an absorbable reaction product, by using an effective amount of a silver salt.

51. The method of claim 32, further comprising the step of adsorbing an adsorbable reaction product produced by the reaction of the gas stream containing hydrocarbons with the plasma discharge.

52. The method of claim 51, wherein in the step of providing a means for adsorbing an adsorbable reaction product, the adsorbing means is a solid capable of adsorbing the adsorbable reaction product.

53. The method of claim 52, wherein in the step of providing a means for adsorbing an adsorbable reaction product, the solid is an effective amount of zeolite.

54. The method of claim 32, wherein in the step of providing the apparatus, a layer of material is operably connected to at least one of the first and second electrodes.

55. The method of claim 54, wherein in the step of providing a layer of material, the layer of material is a material capable of modifying the reaction of the stream of gas containing hydrocarbons with the plasma discharge.

56. The method of claim 55, wherein in the step of providing a layer of material, the layer of material capable of modifying the reaction of the stream of gas containing hydrocarbons with the plasma discharge is a single metal oxide.

57. The method of claim 56, wherein in the step of providing a layer of material, the single metal oxide layer of material is selected from the group consisting of CaO, PbO, Sm_2O_3, and La_2O_3.

58. The method of claim 55, wherein in the step of providing a layer of material, the layer of material capable of modifying the reaction of the stream of gas containing hydrocarbons with the plasma discharge is a multiple metal oxide.

59. The method of claim 58, wherein in the step of providing a layer of material, the multiple metal oxide layer of material is a multiple metal oxide mixture selected from the group consisting of Li/MgO, Sr/La_2O_3, Sm_2O_3, NaOH/CaO, Na_2O/Pr_2O_3, Ca/Ni/K oxide, La_2O_3, Bi_2O_3-K_2CO_3-Al_2O_3.

60. The method of claim 58, wherein in the step of providing a layer of material, the multiple metal oxide layer of material is a perovskite selected from the group consisting of $LaMnO_3$, $LaAlO_3$, $SrTiO_3$, $CrLa_{1-x}Sr_xO_3$, and $BaPb_{1-x}Bi_xO_3$.

61. The method of claim 58, wherein in the step of providing a layer of material, the multiple metal oxide layer of material is a zeolite selected from the group consisting of mordenite, faujasite, Y zeolite, and ZSM5.

62. The method of claim 61, wherein in the step of providing a layer of material, the zeolite is chemically or physically altered so as to provide a zeolite having a substantially changed activity.

63. A method for converting a gas stream containing hydrocarbons to a reaction product effluent containing molecules having at least one carbon atom and at least some of the molecules containing an oxygen atom, comprising the steps of:

providing an apparatus, wherein the apparatus comprises,

a housing having at least one interior surface and at least one exterior surface,

a first electrode and a second electrode, wherein the first and second electrodes are selectively movable in relation to each other and positioned within the housing so as to be spatially disposed a predetermined distance from each other,

means for producing a plasma discharge between the first and second electrodes,

means for passing the gas stream containing hydrocarbons between the first and second electrodes; and

means for collecting the reaction product effluent from the housing;

producing a plasma discharge between the first and second electrodes;

introducing a gas stream containing hydrocarbons and oxygen into the housing, wherein the gas stream is passed into the plasma discharge causing the hydrocarbons within the gas stream to be converted into reacted hydrocarbons having at least two carbon atoms; and

collecting the reacted hydrocarbons as an effluent from the housing.